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THE MOMENTUM

World Exclusive: The amplifier that puts magic into music



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D'Agostino Momentum (£44k/pr)

After less than 18 months in gestation, Dan D'Agostino's Momentum monoblock power amplifier has arrived. It's a debut as awe-inspiring as Led Zeppelin's first LP
 Review: **Ken Kessler** Lab: **Paul Miller**

All things must pass' sang George Harrison, something that applies as well to CEOs of high-end audio manufacturers. Although the names 'Dan D'Agostino' and 'Krell' seemed inseparable to those who have followed the brand for the past three decades, in September 2009, the two parted ways. Krell continues as before, while its co-founder has established Dan D'Agostino Master Audio Systems. With the new company's first product, the Momentum Monoblock Power Amplifier, Dan hopes to re-write the rules of solid-state amplifier design for a second time.

Dan arrived at the 2010 Consumer Electronics Show in Las Vegas armed with drawings of his new amp. In September 2010, a mock-up appeared at Milan's TOP Audio Show, the Momentum representing a departure from previous practice, while sharing some philosophical approaches.

Most notable is the current concern for green issues, which Krell demonstrated in its 'E' versions of the latest power amplifiers. Before even explaining how any hi-fi product can be 'green', we must first admit that *anything* that is manufactured requires raw materials which must be sourced, refined and then possibly transported from myriad countries.

THE VENTURI EFFECT

What Dan and others can only hope to do, after the fact, is ensure that their wares are manufactured as 'greenly' as possible, and then be as efficient as they can in use. Dan D'Agostino's design shows his concern for the environment by addressing its power consumption when not in use. Dan has always been power supply-centric, so that is his *modus operandi* for achieving lower consumption. His new products consume only the slightest trickle of power at idle, a claimed 1W – less than your mobile phone

RIGHT: Top view shows the stepped cooling venturis drilled into the massive solid-copper side sections, flanking 24 output transistors mounted with two stainless steel fasteners for maximum thermal transfer

charger – so they run cooler and (should) save energy. Not bad for a 300W amp that thinks it's a kilowatt.

Certainly, they do not achieve the scalding surface temperatures of Class A amps, running as they do in Class AB, and being merely warm to the touch after a furious session. This is due to the cooling system which provides so much of the Momentum's visual presence, solid-copper bars that form the amplifier's flanks. Dan points out that the thermal conductivity of copper is '91% greater than that of aluminium.' This enabled him to attire the Momentum with smaller heatsinks than one expects of 300W monoblocks, shaping the svelte creature you see here. Conversely, the density of copper means that each unit weighs 40.8kg.

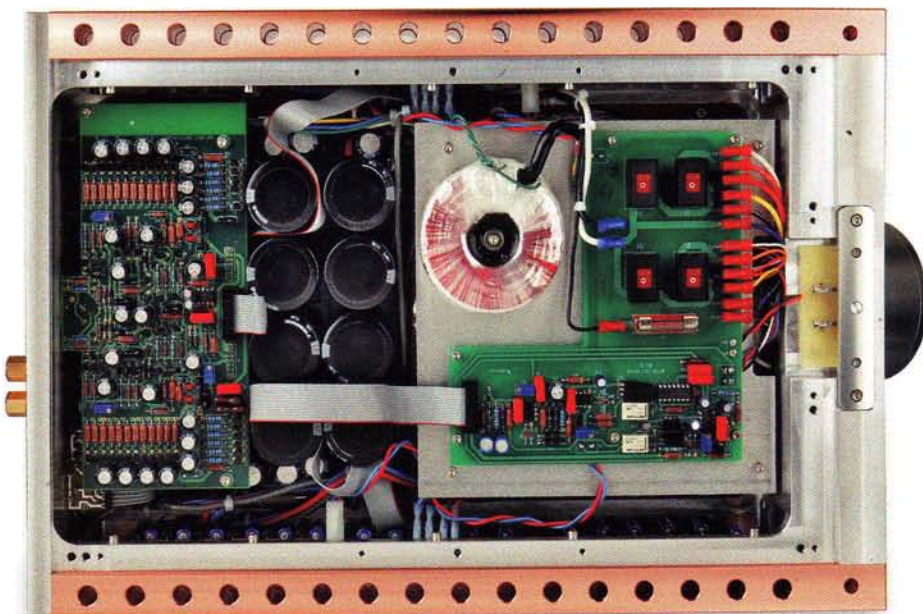
Each heat sink uses venturis instead of fins to produce more efficient cooling, the venturis' mouths measuring 19mm and narrowing to 12mm in the middle. The effect is startling: hold your hand over them and you'd swear a fan underneath was forcing hot air up and out. According to Dan, 'As the air in the top of the venturis heats and expands, the shape of the

venturis forces it upward and draws more air in from the bottom.'

The copper bars embrace a chassis machined from a solid aluminium billet, 'not stamped from sheet metal.' Dan chose this because it's 'non-resonant and provides superior shielding from radio-frequency and electromagnetic interference.'

With the lid off, you see a circuit using 24 high-speed output transistors (capable of 'a blistering 69MHz'). Each transistor is fixed with stainless steel fasteners to improve the thermal transfer to the copper heatsinks. Dan also explained that he opted for costlier circuit boards with through-hole construction, for better heat resistance and potentially longer life than surface-mount boards; they also allow the use of higher-quality capacitors. All resistors are 1% metal-film types, and there are no capacitors in the signal path; the Momentum amplifier is DC-coupled from input to output.

It's also a balanced-operation-only design (though early literature suggested both XLR and RCA single-ended line inputs). This leads to an uncluttered back panel, with only minuscule sockets for on/off





triggers, a fuse holder, IEC three-pin mains cable ingress, a pair of solid multi-way speaker terminals, the aforementioned balanced input via XLR, one tiny toggle switch to set the power meter sensitivity and another to choose between two levels of meter illumination or to switch off the green lighting.

Paranoid as I am, it has always been my policy to advise manufacturers of the partnering equipment in reviews, to avoid later any accusations

of improper usage. As Dan had demonstrated the amplifier at CES with Wilson loudspeakers, he approved of my choice of Sophia 3s, and he had heard

the amps with the Audio Research Ref 5 preamplifier, so that, too, received his blessing. So, please, dismiss any thoughts of a morganatic marriage in either direction: the combination was heavenly.

'A Bugatti Veyron, a 1985 Sassicaia... I wish I'd never laid eyes on them'

Sources included the Musical Fidelity kW DM25 transport/DAC combination and the Marantz CD12/DA12, with wiring from Transparent, Kimber and YTER. No accessories were used at all during the sessions, beyond the Missoni Audio Carpet that covers my listening room's floor.

HELD FAST

First impressions are, as William Hazlitt stated, 'often the truest.' Over the years,

I have found my gut response rarely to be challenged by longer exposure, although – in the case of some audio components, most wines and certainly one's lovers – nuances and details


not immediately apparent may reveal themselves with time. Be that as it may, the *overall* impressions in the broadest sense – love or hate, like or dislike – rarely change. And I knew that the initial exposure to

ABOVE: Green meter LEDs defeated, the Momentum will still not slip unobtrusively into the background. Its lacquered copper and aluminium chassis is pure high end sculpture

the Momentum monoblocks would be as telling as with any item I have reviewed in the past.

Along with informing suppliers of the ancillaries in the review system, I have a second habit: I avoid listening at all to a product under scrutiny until it has enjoyed a suitable warm-up period. I had no idea what state of burn-in Momentum Monoblocks Serial Nos 19 and 20 had undergone prior to arriving at my home, but I suspect they were factory-fresh save for PM's comprehensive lab testing. But, as with Pacino's tormented Michael Corleone, they pulled me back...

What occurred was atypical. The gear arrives. I hook it up. I switch it on. I set the CD player to 'repeat whole disc' and leave it to cook for a day or two. Yes, I usually have that kind of willpower. But as I was leaving the room, the bottom end of the first track on Keb' Mo's *Peace (Back By Popular Demand)* curled around my ankles and held me in place. With my back to the bloody system, no less. I knew, I just *knew* that I was in the presence of something so rare, so special, that I had to stay, protracted warm-up be damned.

This had happened before, if rarely, so I experienced the sensation in exactly the way that a 2004 Tignanello or a Balkan Sobranie (had I not quit smoking) elicits involuntary responses with the seductive charm of any siren you might name. It had accompanied my first taste of the STAX 

THAT WATCH THING

I know, you guys are sick and tired of reading analogies with wristwatches, but you need to know that the Momentum looks the way it does because Dan D'Agostino is a watch aficionado, and was inspired by both the physical construction of wristwatches and the aesthetics of watch dials. As for the construction, Dan admired the precision fitting of watch cases, and so developed the chassis to reveal as few screws or bolts as possible. Its rigidity and solidity are, like the water-resistance of a watch case, the result of ultra-precise machining not normally seen in amplifier cases: no gaps, no folded, tinny steel shell. As for the meter? The colour and numerals resemble those of watch dials from the 18th and 19th Centuries, while the needle is a facsimile of the hour hand designed by Abraham Louis Breguet – the greatest watchmaker of all time.

POWER AMPLIFIER

THE MAN – THE BRAND

Like most of this industry's great designers, Dan D'Agostino couldn't keep his hands off broken radios or record players as a kid. He was destined to work in audio: as a lad, he rebuilt a record player that actually cut onto blank 78s.

While fully half of Dan's life has been his association with Krell, he did not suddenly appear on the scene 'out of nowhere'. Curiously, for those who think of DD as strictly an 'amplifier guy', his immediate employment prior to founding Krell with his then-wife Rondi was working for Dayton-Wright, in both sales and engineering. Chalk up one surprise, then: Dan's cv includes electrostatic loudspeakers.

Possibly more surprising is to learn that Dan once worked for audio's deceased *enfant terrible* Ira Gale, on an amplifier design that never reached production. For some years, Dan enjoyed the use of a shipping crate for the legendary Gale turntable as a coffee table. Other brief forays ensued, before Dan 'saw a hole in the market for a high-powered, Class A amplifier.'

Dan D'Agostino was founder and chief engineer of Krell Industries through to 2009. During his tenure with the brand, he and Krell had elevated Class A operation to must-have status, revised public thinking on 'how much power is enough?' and 'how low can (your impedance) go?' As feisty an individual as the audio industry has seen, it looks like he's prepared to do it all over again.



ELS-F81 electrostatic speaker, the original SME Model 30 turntable, the Apogee Scintilla, and more recently, the Anniversary Audio Research Ref 5. It was open, it was contiguous, it was coherent – all the qualities that separate reality from artifice.

It was, in its own way, terrifying. You just don't expect gains of this level without some sort of herald, some harbinger of greatness. Even 30 years' worth of Krell adventures hadn't set the stage for what will probably be known as 'Second Dan'. Though this skips straight to black belt.

JUST A FLICKER

With Keb' Mo's rich voice unleashed, in front of ripe lower registers, twanging bottleneck guitar work and deliciously chiming piano, I noticed other curious events. The

meters seemed not to move, the Ref 5 was only reading around 10 on the display, yet I was hearing sounds that filled the room, at levels I would call realistic and my wife might adjudge as a shade too loud. Were the meters damaged? I tried the three sensitivity settings, but even the highest yielded no flicker of the Breguet hand with its moon-shaped tip.

For the sheer hell of it, I cranked up the volume to 60 on the Ref 5 (out of 100) and finally, the needles were dancing. Whether attesting the unbridled power on tap, or the confirmation that – as I long suspected – the Sophia 3s are the least power-hungry high-end speakers one can buy this side of a horn, there was no sensation of the system ever working hard. It called for second and third opinions, the ever-dependable ears of friends Jim Creed and

ABOVE: A low-profile look – it's only 127mm tall – defines the Momentum, but its signature touch will surely be the meter, inspired by the hands and dial on a Breguet watch

vinyl addict Mark Steadman, both of whom stood shell-shocked.

Levels approaching the legally actionable, no clipping within ear-range, Sophias unflapped, the sound exhibited no discernible flaws. Emmylou Harris' newest, *Hard Bargain*, is peppered with unusual percussion sounds, like the djembe,

her crystalline voice hovering over rich terrain. Acoustic guitars and massed vocals behind her, shimmering sounds of indefinable sources – it was as if *Deadwood* had come back for a fourth series.

'It was as if I'd suddenly grown a pair of ESL57s with no limits'

The Momentum (are two 'Momenta'?) held up a tapestry, but one so finely woven that no coarse texture could be sensed to pixilate the whole in the manner of Bayeux. Damn, it was as if I'd suddenly grown a pair of Quad ESL 57s with no limits to either their bass extension nor the maximum SPLs.

Perhaps the biggest thrill was Bonnie Raitt's recently unearthed live session from 1972, *The Lost Broadcast* (which I implore you to order right now) for its primarily unplugged subtlety. While some might argue that the recording is less than perfect, the stereo is convincing, and the intimacy so palpable – apparently she was playing for under 100 people – that you might want to check your deodorant.

Hers is a voice I have adored for nearly 40 years, one that's indescribably distinctive without being alien or ☺

LAB REPORT

D'AGOSTINO MOMENTUM (£44k/pr)

It's tempting to think that the first amplifier designed outside of Krell by the man who personified the brand would behave, well, like a Krell. But the Momentum has its own, unique credentials. Dan's near-religious use of supply regulation ensures the Momentum not only bests its 300W rating at 335W/8ohm and a solid 575W/4ohm but this tolerance also ensures a full 380W, 725W, 1.33kW and 2.22kW is delivered under dynamic conditions at <1% THD into 8, 4, 2 and 1ohm loads [see Graph 1, below]. Readers of my lab reports will recognise this as not un-Krell-like but the Momentum achieves said power output from a moderately high 0.15-0.16ohm output impedance and – importantly – with a very different set of distortion curves.

Versus power, distortion increases from a minimum of 0.015% at 1W, plateauing out at 0.05% from 8-40W and then increasing again to 0.09% at 100W, 0.19% at 200W and 0.7% at 300W/8ohm. Versus frequency [see Graph 2, below] this distortion is impressively uniform through bass, midrange and low treble only really increasing at 10kHz (0.08%), 20kHz (0.11%) to 40kHz (0.18%). And, despite its moderate output impedance, the Momentum's response remains almost entirely unphased by the speaker load, maintaining a response that's utterly flat from 1Hz(!) through to 20kHz (-0.06dB) and 100kHz (-1.3dB) within a tolerance of 0.2dB at 100kHz into loads from 100ohm down to 1ohm. Any flies in the ointment? Hum and noise is fractionally high in this early sample (yielding an A-wtd S/N of 78dB re. 0dBW, 104dB re. 300W). Readers are invited to view a comprehensive QC Suite test report for D'Agostino's Momentum monoblock amplifier by navigating to www.hifinews.com and clicking on the red 'download' button. PM



ABOVE: Each Momentum offers an XLR balanced input and single binding posts only. Note the two tiny toggle switches to operate meter sensitivity and illumination

exaggerated, which breeds its own familiarity. Add to it spectacular guitar playing, even at the tender age of 22, and it is a CD of sublime grace for those who 'get' rural blues. As portrayed here it sounded as if it had been recorded today, any imperfections due to the hardware of the day, or 39 years in the can, rendered invisible, like fine scratches on the lenses of eyeglasses that you can focus past.

BEYOND REACH, YET...

On to the studio creations of Nick Lowe: the recently remastered *Labour Of Lust* and the earlier *Jesus Of Cool*. Lowe's facility is for creating deceptively simple, irresistibly catchy songs with the kind of intricacies that seem to work unobtrusively in the background. So, too, the Momentum. Given Dan D'Agostino's choice of a Breguet watch as the inspiration for the meter on the Momentum, an apt analogy is the way that a dial covers a timepiece's inner workings. You see the time, communicated through the hands and the numerals against which they're positioned, rarely aware of the machinations under way a mere millimetre beneath.

So, similarly, you can look upon masterpieces like 'Cruel To Be Kind' and 'I Love The Sound Of Breaking Glass' as throwaway singles – Lowe himself describes his method as 'bashing them out' – but that is like calling a Ladurée macaroon a 'cookie'. Layer upon layer was revealed through the Momentum, yet without any sensation that the Brothers Roux were poised over onions, peeling back near-transparent layers.

No component has had such a profound effect on me, in and of itself, for many years. Normally, such

lump-in-throat prose ascends from my gullet only if some personal event or tragedy had accompanied the review, like the passing of its maker. Inspired though I am by the Momentum, I could not escape one nagging, aching regret: I only wish that Alastair Robertson-Aikman of SME, who cherished Dan D'Agostino's early achievements, had lived to hear this latest masterpiece.

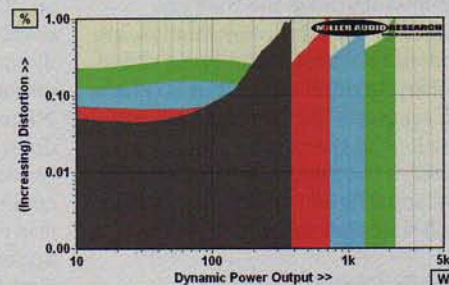
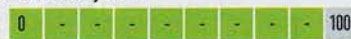
Because I will never be able to afford a pair of Momentum monoblocks, I have to reveal an embarrassingly petty, venal and negative reaction, as well. Yes, I am ashamed to say this, but I must... My emotional immaturity means that their inapproachability places them in the company of the Bugatti Veyron, a 1985 Sassicaia and a weekend with Gillian Anderson. Which is to say: in some ways, I wish I'd never laid eyes on them.

But equally, having driven some amazing vehicles and heard some incredible audio systems, none of which came home with me, I must also admit that my life is all the richer for it. ☺

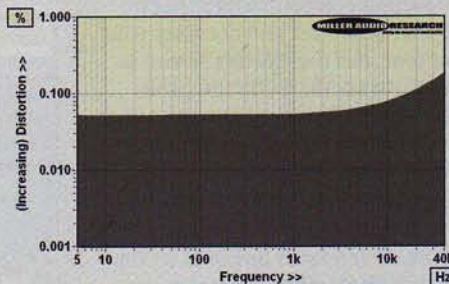
HI-FI NEWS VERDICT

We all love lists: *Desert Island Discs*, *50 Best TV Ads* or, as audiophiles, one's fave components. The Momentum has bull-dozed its way into my All-Time Top 5 Power Amp list, alongside the Dynaco Stereo 70, McIntosh MC275, Radford MA15 and Marantz Project T-1. The lone solid-stater amidst valves, the Momentum is enough to make you get religion. It may, perhaps, be the best amp on the planet.

Sound Quality: 89%



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Excellent load tolerance



ABOVE: Distortion versus extended frequency from 5Hz-40kHz at 10W/8ohm. Note uniform behaviour

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	335W / 575W
Dynamic power (<1% THD, 8/4/2/1ohm)	380W / 725W / 1.3kW / 2.2kW
Output impedance (20Hz-20kHz)	0.15-0.17ohm
Frequency response (20Hz-100kHz)	+0.0dB to -1.3dB
Input sensitivity (for 0dBW/300W)	193mV / 3350mV (balanced)
A-wtd S/N ratio (re. 0dBW/300W)	78.0dB / 104.2dB
Distortion (20Hz-20kHz, 10W/8ohm)	0.05-0.11%
Power consumption (Idle/Rated o/p)	1W/506W
Dimensions (WHD)	318x109x470mm